



Dean K. Matsuura
Manager
Regulatory Affairs

October 28, 2009

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The Honorable Chairman and Members
of the Hawaii Public Utilities Commission
Kekuanaoa Building, First Floor
465 South King Street
Honolulu, Hawaii 96813

Dear Commissioners:

Subject: Docket No. 2008-0083 – Hawaiian Electric 2009 Test Year Rate Case
Hawaiian Electric Hearing Exhibits for Panel 5

Enclosed for filing are Hawaiian Electric Company, Inc.'s ("Hawaiian Electric") hearing exhibits that were presented yesterday at the panel hearing for the Campbell Industrial Park Combustion Turbine No. 1 ("CIP CT-1"):

- Hearing Exhibit 4 – Hawaiian Electric's September 16, 2009 letter to the Commission and Consumer Advocate regarding a proposal for emergency use of CIP CT-1;
- Hearing Exhibit 5 – Consumer Advocate's September 30, 2009 letter in response to Hawaiian Electric's September 16, 2009 letter;
- Hearing Exhibit 6 – Hawaiian Electric's October 12, 2009 letter to the Commission regarding the emergency use of CIP CT-1.

Very truly yours,

Enclosures

cc: Division of Consumer Advocacy
Michael L. Brosch, Utilitech, Inc.
Joseph A. Herz, Sawvel & Associates, Inc.
Dr. Kay Davoodi, Department of Defense
James N. McCormick, Department of Defense
Theodore E. Vestal, Department of Defense
Ralph Smith, Larkin & Associates

Hawaiian Electric Company, Inc. • PO Box 2750 • Honolulu, HI 96840-0001



Robert A. Alm
Executive Vice President

September 16, 2009

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PUBLIC UTILITIES
COMMISSION

The Honorable Chairman and Members
of the Hawaii Public Utilities Commission
465 South King Street
Kekuanaoa Building, First Floor
Honolulu, Hawaii 96813

Ms. Catherine P. Awakuni
Executive Director
Division of Consumer Advocacy
Department of Commerce and Consumer Affairs
P. O. Box 541
Honolulu, Hawaii 96809

Dear Commissioners and Ms. Awakuni:

Subject: Proposal for Emergency Use of Campbell Industrial Park Combustion Turbine
No. 1 ("CIP CT-1")

Hawaiian Electric Company, Inc. ("Hawaiian Electric" or "Company") respectfully submits a proposal for limited use of the CIP CT-1 under emergency circumstances. Hawaiian Electric files this proposal and requests approval from the Commission and the Consumer Advocate pursuant to Exhibit A of the Joint Motion for Approval of Stipulation ("Joint Motion") filed by Hawaiian Electric and the Consumer Advocate on December 4, 2006 in Docket No. 05-0145 ("Exhibit A"), wherein Hawaiian Electric committed to working with the Commission and the Consumer Advocate to address emergencies or operational problems affecting the use of the CIP CT-1 unit.¹

Particularly during this hurricane season, we at Hawaiian Electric are reminded that natural disasters and other catastrophic events could happen at anytime, and impact to our electric system could range from minimal to severe. Proper preparation and planning are therefore necessary and vital to fulfilling our commitment to service reliability for our customers. This

¹ Item 8 of Exhibit A states: "If there is an interruption of the biofuel supply or an emergency or operational problem that would affect the use of the CT Unit, Hawaiian Electric will work with the Consumer Advocate and the Commission to attempt to address such contingencies." The Commission approved the Joint Motion in Decision and Order No. 23457 filed on May 23, 2007 in Docket No. 05-0145.

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Catherine P. Awakuni, Esq.
September 16, 2009
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preparation includes working closely with State Civil Defense and the City & County Department of Emergency Management (including first responders, such as Honolulu Police Department, Honolulu Fire Department, Emergency Medical Services, among others) to monitor and prepare for hurricanes, tropical storms and other events that are forecasted to affect Hawaii. On an ongoing basis, we look at ways to operate and maintain our transmission and distribution infrastructure and all of the generating units available to us in anticipation of potential hurricane and other storm related, natural disaster impacts to the system.

With respect to the CIP CT-1 unit, as the Commission and Consumer Advocate are aware, we are in the process of requesting proposals for biofuel supplies for the unit, and until proper approvals and permits are received, the unit will not be operated to serve customer load except pursuant to the Commission's orders or instructions. By this letter, Hawaiian Electric proposes to call on the unit as a last resort generation resource to mitigate spinning reserve and generation capacity shortfall situations² that have a high potential to lead to or have already led to load shedding and island-wide blackouts. We strongly believe the CIP CT-1 should be available for limited emergency duty under these high operational risk and service stabilization and restoration conditions. This unit is particularly effective under these circumstances, given its black-start capability, which not only provides an additional resource to address an island-wide blackout situation, but its faster start-up feature can then be used to more quickly restart the other units on the system.³ The public expects, and our customers deserve, the Company's fullest efforts to keep the lights on, and availability of this unit during these critical times will give reassurance that such efforts are being made. This very limited option to operate the unit if a serious disturbance condition exists does not eliminate the possibility of a disturbance spreading but it does reduce its likelihood.

Hawaiian Electric proposes two categories for emergency use of the CIP CT-1: (1) situations in which Commission and Consumer Advocate approvals will be sought on a case-by-case basis, prior to starting up the unit; and (2) critical and high-risk situations in which the Company will

² Spinning reserve ("SR") is the portion of the operating generating unit's output that is not currently serving demand. For example, if a 100 MW generating unit is operating at 60 MW, it has 40 MW of SR. The purpose of having adequate SR as an operating criterion is to avoid customer disruptions and potential system instability caused by the sudden loss of the largest generating unit on the grid (e.g., AES at 180 MW). When the criterion cannot be achieved (due to, for example, the unavailability of smaller units), a spinning reserve shortfall, or deficit, is created where the risks to customer and system stability increase should a unit trip during the shortfall period. The larger the deficit, the greater the risk. "Generation capacity shortfall" is when SRs are depleted and supply (generation) is unable to meet demand. At this point, system frequency will decay below 60 Hz (i.e., underfrequency). If additional capacity (generators) cannot be brought on line to make up for the capacity shortfall, customer load shedding (manual or automatic) may be necessary to minimize the risk of a total system collapse until more capacity can be brought on line.

³ A majority of the other generating units are steam units, which take much longer to start up.



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have flexibility and discretion to use CIP CT-1 at its call. This proposal is discussed below and in the attached Power Point presentation entitled "Emergency Utilization of CT-1".

1. **Use of the CIP CT-1 With Approval on a Case-by-Case Basis**

The Company proposes to contact the Commission and the Consumer Advocate for approval of CIP CT-1 use during limited spinning reserve shortfall situations if internal assessment of available generating units and operators' best judgment indicate that the operation or standby of the CIP CT-1 is critical to mitigate the risk at hand.

As background, the Company uses Generation Condition ("Gen Con") levels to characterize the amount of excess or shortfall of spinning reserves available at any given time. Use of these levels to describe the state of the system helps to facilitate contingency planning efforts in the event of spinning reserve or generation capacity shortfalls. The table presented on Slide 6 of the attachment defines each Gen Con level and describes the general state of the system at those levels.

The situations in which we propose to request Commission and Consumer Advocate approval to start the CIP CT-1 are when the system is under Gen Con 1 or Gen Con 2, which are spinning reserve shortfall conditions in which the operating criterion is not met. Generally, these are the stages at which the system may be at increasing levels of risk due to a natural disaster or other serious disturbance event and at a stage in which there is sufficient time to obtain Commission and Consumer Advocate approval to prepare and respond to the event. Note that the Company will evaluate the specific circumstances of each Gen Con 1 and Gen Con 2 situation in deciding whether or not to seek Commission and Consumer Advocate approval to operate the CIP CT-1, thus not every occurrence of Gen Con 1 or 2 will result in a request for CIP CT-1 start-up. If indications are that the system is particularly vulnerable due to inadequate spinning reserves or quick load pickup capability from available generating units and other considerations, Hawaiian Electric may contact the Commission and the Consumer Advocate to request permission to use the CIP CT-1. Our assessment will depend on the specific circumstances, as each situation is unique.

Individual approvals for such events, if granted by the Commission, will expire when load decreases or additional generation is available that restores the system to Gen Con Alpha. If the situation is such that the Gen Con 1 or Gen Con 2 condition lasts for more than one day, Hawaiian Electric will request a new or an extension of the approval for limited operation of the CIP CT-1.

Slide 7 (Gen Con Statistics) of the attachment includes a recent historical perspective



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of the number of days per year the Company has been in Gen Con 1 and Gen Con 2 levels. For example, in 2007, 2008 and the first seven months of 2009, there were 8 days, 5 days and 0 days, respectively, in which the system was in either Gen Con 1 or 2. Based on these annual statistics and the fact that not every Gen Con 1 or 2 instance will result in a request to operate CT-1, Hawaiian Electric does not expect to frequently seek approval for use of the unit.

Slide 8 of the attachment includes an example of an actual Gen Con 1 and 2 situation in which the Company would have sought approval for use of the CIP CT-1 to address the problem.

2. **Use of the CIP CT-1 Without Requirement for Case-by-Case Approval**

Hawaiian Electric further proposes that under Gen Con 3 (insufficient spinning reserve to cover the loss of even the smallest running unit) and Gen Con 4 (insufficient generation to serve load) and when an island-wide blackout has occurred, the Company be allowed the flexibility to automatically call for operation of the CIP CT-1 at our discretion. During these especially critical situations, time is of the essence. Our system operators need to be able to act quickly and decisively and remain focused on keeping the system stable, and if necessary, restoring system stability and service should load shedding (manual or automatic) or a total island-wide blackout occur.

Referring again to Slide 7 that shows the annual Gen Con statistics, the number of days the system was in either Gen Con 3 or 4 were 3 days, 2 days and 0 days in 2007, 2008 and the first seven months of 2009, respectively. These instances historically have not been frequent occurrences.

Accordingly, we are respectfully requesting advanced approval from the Commission and the Consumer Advocate to exercise this flexibility only under these limited conditions whenever they occur. If such advanced approval is granted, in those instances when a severe spinning reserve shortfall, manual or automatic load shedding, and/or an island-wide blackout has occurred, the Company would not contact the Commission or the Consumer Advocate for case-by-case approval prior to starting up the CIP CT-1. We would, however, notify the Commission and the Consumer Advocate that we are in Gen Con 3 or 4 as quickly as possible. Once operations are restored to normal (i.e., Gen Con Alpha), we would discontinue use of the CIP CT-1.

Slides 9-11 of the attachment describe examples of actual Gen Con 3 and Gen Con 4 situations experienced in the past in which the Company would have started up the



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CIP CT-1 immediately to address the problem.

We would like to explore with you an agreed-upon process for obtaining the necessary case-by-case approvals under the first category above. We envision development of a contact list of primary and backup representatives from the Commission and the Consumer Advocate that the Company would refer to in obtaining approvals as expeditiously as possible.

To more fully discuss the Company's proposal and to answer any questions you may have, we would appreciate an opportunity to meet with you. We will be contacting your offices shortly to ask about scheduling an appointment.

In the meantime, should you have any questions, please do not hesitate to contact me. Thank you for your consideration.

Very truly yours,



ROBERT A. ALM
Executive Vice President

Attachment

cc: Stacey K. Djou, Esq., Commission Chief Counsel



Emergency Utilization of CT-1

September 16, 2009

Proposed Emergency Operation of CT-1 Based on Its Availability

Start CT-1 in emergency situation
for Generation Contingency (Gen Con)
and operations with zero spinning
reserve, load shedding or
island-wide blackout.

- At Gen Con 3, spinning reserve is insufficient to cover the loss of any unit. Immediate start up of CT-1 is required to avert a Gen Con 4 situation.
- At Gen Con 4, there is insufficient generation to serve load and load shedding is initiated. Immediate start up of CT-1 and all other available standby units are required to mitigate the Gen Con 4 situation and prevent an island-wide blackout.
- At island-wide blackout, immediate start up of CT-1 is required as part of the parallel Black Start process. Duration of operation will be based on system restoration and stability needs.

**Case-by-case PUC/CA approval
required to start CT-1 for Gen Con 1
and Gen Con 2 situations**

- CT-1 operation will not be required for minor disturbances where spinning reserve (SR) and quick load pickup (QLPU) are adequate to mitigate the problem and standby capacity is available to restore SR and QLPV to normal levels.
- CT-1 operation may be required for serious Gen Con 1 and 2 situations that may escalate to Gen Con 3 or 4. In these cases, a system condition assessment will be performed to justify operation of CT-1. Decision to start CT-1 will be contingent upon case-by-case regulatory approval.

Background

- Disturbances are abnormal events that cause an imbalance between supply (generation) and demand (customer load) that impacts frequency and voltage
 - Small disturbances can be small; little impact or risk
 - Large disturbances with substantial frequency/voltage deviations can pose risk to overall system stability and integrity
- Where disturbances are caused by sudden shortfall in generation (i.e., generating unit forced outage), system stability is maintained with spinning reserves (SR) and quick load pickup (QLPU) capability from the remaining generating units

Background

- Spinning Reserve (SR) is the portion of the operating generating unit's output that is not currently serving demand
 - Example: If a 100 MW generating unit is operating at 60 MW, it has 40 MW of spinning reserve
- QLPU is the portion of a generating unit's SR that may be available to pick up load within 3 seconds
 - Example: If 25 MW out of the 40 MW of SR may be available within 3 seconds, then the unit has 25 MW of QLPU

Background

- Having adequate SR as an operating criterion avoids customer disruptions and potential system instability caused by sudden loss of the largest generating unit on the grid (e.g., AES at 180 MW)
 - When the criterion cannot be achieved (e.g., due to the unavailability of units that may be on overhaul and/or higher than expected customer load), a spinning reserve shortfall, or deficit is created and risks to customer and system stability increase should a unit trip during the shortfall period
- When SR and QLPU capability are depleted below the levels required to cover for the loss of the largest generating unit (i.e., SR shortfall), risks to the customer and system stability increase
 - If there are generating units on standby prior to the sudden loss of generation, additional units are started to restore SR and QLPU to the extent possible
- Generation Conditions (Gen Con) based on various SR levels have been established with escalating levels of risks to facilitate contingency planning efforts in the event of spinning reserve or capacity shortfalls

Generation Condition Levels Based on Spinning Reserve

Gen Con Level	Spinning Reserve (MW)	Excess Spinning Reserve (MW)	State of the System
Gen Con Alpha	180MW	XSR ¹ > 0	Normal, at least 1 unit on reserve
Gen Con Beta	180MW	XSR > 0	Normal, no standby reserves ²
Gen Con 1	140MW < SR < 180MW	-40MW ³ < XSR < 0MW	Disturbance, i.e., loss of AES, K5, or K6
Gen Con 2	90MW < SR < 140MW	-90MW ³ < XSR < -40MW	Disturbance, i.e., loss of S7-8, K1-4 in addition to AES, K5, or K6
Gen Con 3	0MW < SR < 90MW	-180MW ³ < XSR < -90MW	Disturbance, i.e., loss of any unit
Gen Con 4	SR < 0MW	XSR < -180MW ³	Underfrequency load shedding or island-wide blackout

Note 1: "XSR" means Excess Spinning Reserve, which is the amount of generation in excess of the largest generating unit which is typically AES at 180 MW.

Note 2: "No standby reserves" means that no generating units are available for start up.

Note 3: The 40 MW XSR value is based on the difference between AES at 180 MW and a 140 MW reheat unit (K5, K6). The 90 MW XSR value is based on the difference between AES at 180 MW and a 90 MW reheat unit (W7, W8, K1-4).

Note 4: 180 MW is the generation capacity and normal loading of the AES unit on the system. If AES suddenly trips from 180 MW, system frequency will immediately begin to decay. Spinning reserves from all operating generators are used to make up for the sudden loss and arrest the decay in system frequency. If available, additional units are started to help restore system frequency, SR, and QLPU back to normal.

Gen Con Statistics

2007 – 2009 YTD Through July

YEAR	BETA (Days)	Gen Con 1 (Days)	Gen Con 2 (Days)	Gen Con 3 (Days)	Gen Con 4 (Days)	Comments
2007	31	3	5	2	1	* Kahe-CEIP #2 trip-close, K4, K5, K6 trip on transformer sudden pressure resulting in load shed
2008	10	4	1	6	2	* December 26, 2008 Island-Wide Blackout (2 days)
2009 YTD	11	0	0	0	0	
Total	52	7	6	8	3	

Emergency Utilization of CT-1

Gen Con 1 – Gen Con 2

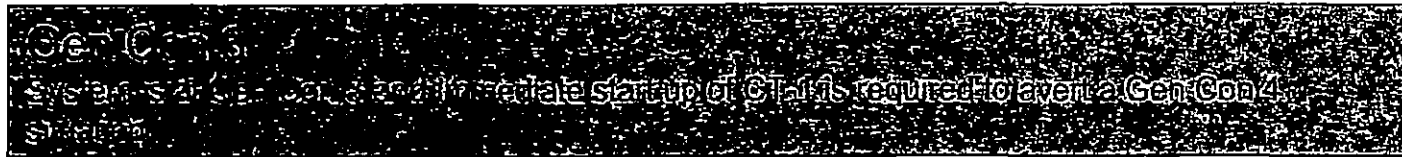
CT-1 operation may be required for serious situations that may escalate to Gen Con 3 or 4 (i.e., UFLS). In this case a system condition assessment will be performed to justify operation of CT-1. Decision to start CT-1 will be contingent upon case-by-case regulatory approval.

The example below describes an actual situation where a request to start CT-1 would have been initiated. This example started as a Gen Con Beta incident that escalated to Gen Con 1, Gen Con 2, and eventually Gen Con 3.

1/31/07

Ocean debris (sea grass) fouled the condensers and chillers on all units at the Kahe Power Plant, forcing the units to be derated. A request to start CT-1 would have been initiated based on the severe derating of multiple generating units caused by the sea grass infiltration to restore SR and QLPU and reduce risk of a major generation related outage.

Emergency Utilization of CT-1



The examples below describe actual situations where CT-1 would have been started as soon as possible.

2/2/07

Kahe CEIP2 138 kV transmission line trips and recloses. Kahe 4 (93 MW), Kahe 5 (142 MW), and Kahe 6 (142 MW) trip on "transformer sudden pressure". System immediately went from Alpha (normal) to Gen Con 3. A request to start CT-1 would have been initiated based on the forced outages of three large generating units at Kahe to provide SR and QLPU and reduce risk of a major generation related outage.

11/04/07

Loss of the Waiau start-up transformer rendered W3 (49 MW), W4 (49 MW), W8 (94 MW), W9 (50 MW) and W10 (50 MW) unavailable. W3 and W4 are cycling units that were available but not running at the time, W8 is a base load unit that tripped, and W9 and W10 are peaking units that were available but not running at the time.

Emergency Utilization of CT-1

Load Shedding - Gen Con 4
When a major generating unit trips, the status of CT-1 and all other available standby units are required to mitigate the generating capacity situation and prevent an island-wide blackout.

The examples below describe actual situations where CT-1 would have been started as soon as possible.

12/19/02

AES forced outage from 180 MW also resulted in tripping HRRV (46 MW) and K3 (92 MW). Automatic underfrequency load shedding was initiated to arrest the decay in system frequency. All available generating units on standby would have been started immediately following the AES trip.

6/1/06

Kahe-Halawa #1 138 kV transmission line tripped followed by Kalaeloa total plant outage (180 MW), W10 (50 MW) and W9 (50 MW). Manual UF load shedding and automatic undervoltage load shedding were necessary to arrest system instability.

Emergency Utilization of CT-1



The examples below describe actual situations where CT-1 would have been started as soon as possible.

10/15/06

Earthquake triggered a chain of events that resulted in an island-wide blackout. The initiation of a black start of CT-1 in addition to the parallel black start efforts at Waiau, Kahe would have occurred to expedite system restoration.

12/26/08

Lightning triggered a chain of events that resulted in an island-wide blackout. The initiation of a black start of CT-1 in addition to the parallel black start at Waiau, Kahe would have occurred to expedite system restoration.

LINDA LINGLE
GOVERNOR

JAMES R. AIOA, JR.
LT. GOVERNOR



LAWRENCE M. REIFURTH
DIRECTOR

CATHERINE P. AWAKUNI
EXECUTIVE DIRECTOR

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September 30, 2009

The Honorable Chairman and Members of
the Hawaii Public Utilities Commission
Kekuanaoa Building
465 South King Street, 1st Floor
Honolulu, Hawaii 96813

Dear Commissioners:

RE: Hawaiian Electric Company, Inc.'s Letter Filed with the Commission
on September 16, 2009, *Proposal for Emergency use of Campbell Industrial Park
Combustion Turbine No. 1 ("CIP CT-1")*.

This letter is in response to Hawaiian Electric Company, Inc.'s ("HECO") proposal for limited use of its Campbell Industrial Park Combustion Turbine No. 1 under emergency conditions as set forth in its September 16, 2009 letter to the Commission, *Proposal for Emergency Use of Campbell Industrial Park Combustion Turbine No. 1 ("CIP CT-1")*.

In general, HECO is requesting to operate its CIP CT-1 unit in two types of situations:

1. During times of limited spinning reserve¹ shortfall based on HECO's internal assessment of available generating units and its operators' best judgment that indicate the operation or standby of the CIP CT-1 is critical to mitigate risks to the system due to natural disaster or other serious disturbance event defined as Generation Condition² ("Gen Con") 1 or 2. Under this situation, HECO will seek Commission and Consumer Advocate approvals on a case-by-case basis prior to starting up the unit.
2. During critical and high-risk times such as: (1) insufficient spinning reserve to cover the loss of even the smallest running unit (Gen Con 3); (2) insufficient generation to serve load (Gen Con 4); and (3) the occurrence of an island-wide

¹ "Spinning reserve" is the generating capacity of a unit that is in operation (spinning) at an output that is less than its maximum generating capability and thus, the unit has capacity in reserve, hence, "spinning reserve."

² The Company states that it uses Gen Con levels to characterize the amount of excess or shortfall of spinning reserves available at any given time. Details of the Gen Con levels were included in HECO's September 16, 2009 letter.

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blackout. In this situation, the Company is requesting to have flexibility and discretion to use CIP CT-1 whenever these conditions occur.

In a meeting held on September 21, 2009 to discuss this matter, the Commission offered an alternative to HECO's suggestions, indicating that instead of seeking approvals from the Commission and the Consumer Advocate to operate the unit during Gen Con 1 or 2 and notification of operation of the unit during Gen Con 3 and 4, that the Company should notify the Commission and Consumer Advocate of operation of the unit during Gen Con 1, 2, 3, or 4. Based on its review, the Consumer Advocate does not object to HECO's request to utilize CIP CT-1 on a limited basis under the emergency conditions, provided that the Commission and the Consumer Advocate are notified of such use during Gen Con 1, 2, 3, or 4.

In its review, the Consumer Advocate considered the additional information provided in HECO's *Supplemental Testimonies and Exhibits* filed in Docket No. 2008-0083 and the actual recorded peak loads for 2009 to-date.

In HECO ST-4 filed in Docket No. 2008-0083, the Company provided an update to its sales and peak ("S&P") forecast in May 2009 with a comparison to its last S&P forecast (September 2008) which is summarized below.³

Net System Peak (MW) (with Future DSM, but without Load Management & Rider I)		
Year	September 2008 S&P (2009 Adequacy of Supply Report)	May 2009 S&P
2009	1,246	1,183
2010	1,243	1,165
2011	1,252	1,176
2012	1,264	1,208
2013	1,296	1,219
2014	1,319	1,243

Based on the updated May 2009 S&P forecast, the Company recalculated the reserve capacity of its system without CIP CT-1 as:⁴

Year	Reference Scenario (MW)	Higher Load (Add 60 MW) (MW)
2009	-10	-70
2010	20	-40
2011	10	-50
2012	-30	-90
2013	-10	-70
2014	-10	-70

³ Docket No. 2008-0083, HECO ST-4, page 10.

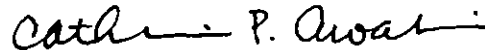
⁴ Docket No. 2008-0083, HECO ST-4, page 11.

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September 30, 2009

Based on the above, the Company's system experiences reserve capacity shortfalls for all but the reference scenario in the years 2010 and 2011. The Consumer Advocate notes that forecasting is not an exact science and actual loads may exceed forecast values such that reserve capacity shortfalls may be experienced even in the years 2010 and 2011. In fact, the Consumer Advocate notes that the recorded peak load as of 2009 to-date for HECO's system was 1,220 MW⁵ (higher than the May 2009 S&P for the years 2009 through 2013), which would result in a much higher reserve capacity shortfall for even the year 2009.

As such, the Consumer Advocate believes that allowing the Company to utilize CIP CT-1 under the emergency conditions set forth in the September 16, 2009 letter will provide the Company with sufficient generation capacity on its system to mitigate concerns where: (1) spinning reserve is anticipated to be limited; and (2) there are immediate concerns with spinning reserve shortfall or insufficient generation to meet load requirements. As outlined in Docket No. 05-0145, CIP CT-1 is a unit, especially with its black start abilities, that will be instrumental in addressing the possibilities of generation capacity shortfalls and/or the possibilities of an outage. Thus, with the understanding that HECO will utilize a notification procedure where it notifies the appropriate personnel from the Commission and Consumer Advocate, *rather than seek approval in certain circumstances*,⁶ the Consumer Advocate does not object to the Commission granting the requested authority.

Sincerely,



Catherine P. Awakuni
Executive Director

CPA:dl

c: Stacey K. Djou, Esq., Commission Chief Counsel
Robbie A. Alm, Executive Vice President
Dean Matsuura, Manager of Regulatory Affairs
Thomas W. Williams, Jr., Esq.

⁵ Information provided by Company personnel on September 25, 2009.

⁶ It should be noted that, while the subjects are related, the Consumer Advocate's position on this matter is not meant to address the issue of "used and useful" and cost recovery issues. The Consumer Advocate's position is predicated on the understanding that there might be possible need for plant that is available for use and that HECO should be responsible for making the decision to use CIP CT-1 until the regulatory issues are resolved and not require HECO to obtain prior regulatory permission in the event of or during the occurrence of an emergency or urgent need for CIP CT-1.

Hawaiian Electric Company, Inc. • PO Box 2750 • Honolulu, HI 96840-0001



Dean K. Matsuura
Manager
Regulatory Affairs

October 12, 2009

FILED
2009 OCT 12 P 3:51
PUBLIC UTILITIES
COMMISSION

The Honorable Chairman and Members
of the Hawaii Public Utilities Commission
465 South King Street
Kekuanaoa Building, First Floor
Honolulu, Hawaii 96813

Dear Commissioners:

Subject: Emergency Use of Campbell Industrial Park Combustion Turbine No. 1

Hawaiian Electric Company, Inc. ("Hawaiian Electric" or "Company") respectfully informs the Commission and the Division of Consumer Advocacy of the Department of Commerce and Consumer Affairs ("Consumer Advocate") that on October 9, 2009, from 5:17 p.m. to 6:21 p.m., the Campbell Industrial Park Combustion Turbine No. 1 ("CIP CT1") was used for "emergency purposes", i.e., when the system is in a Generation Condition ("Gen Con") 1, 2, 3 or 4 condition.¹ The Company is submitting this letter pursuant to the requirement for Hawaiian Electric to submit written notification to the Commission and the Consumer Advocate within three days after CIP CT1 is used for emergency purposes.²

On October 9, 2009, the Hawaiian Electric system was in a Gen Con Level 1 condition due to a) the shutdown of Kahe 6 that occurred the evening of October 7, 2009 to repair a reheater valve steam leak, b) the unexpected shutdown of Waiau CT10 at 3:51 p.m. on October 9, 2009 due to the initiation of the unit's CO2 fire suppression system, c) the high system loads that occurred from October 5 to 9, 2009 (i.e., the highest system peak loads for both the day and evening peaks in 2009), which were primarily due to high temperatures and virtually no winds, and d) the unexpected heavy rains that caused the National Weather Service to issue a flash flood advisory on October 9, 2009 beginning at 2:49 p.m.

System Events

Beginning October 7, 2009, the system load that was being served by the Hawaiian Electric generating units and the independent power producers ("IPPs") totaled 1,246 megawatts ("MW")

¹ Hawaiian Electric uses Gen Con levels to characterize the amount of excess or shortfall of spinning reserves available at any given time. Use of these levels to describe the state of the system helps to facilitate contingency planning efforts in the event of spinning reserve or generation capacity shortfalls.

² See Hawaiian Electric's response to PUC-IR-117 (pages 13-15), filed October 6, 2009 in Docket No. 2008-0083.

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of the Hawaii Public Utilities Commission
October 12, 2009
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for the day peak and 1,260 MW for the evening peak, which were to date the highest loads served by Hawaiian Electric in 2009. On this day, without CIP CT1, there was sufficient spinning reserve for the Hawaiian Electric system, with Honolulu 9, Waiau CT10, and the distributed generators ("DGs") serving as the off-line reserve. That evening, after the evening peak, Kahe Unit 6 with a capacity of 142 MW was taken off-line so that important work to repair a steam leak could be made to ensure the safety of power supply personnel as well as ensuring the reliability of the Kahe Unit 6.³

The system load for October 8, 2009 was forecasted to be the same as the loads experienced the previous day because of the identical weather conditions. The total available generation (all units running including the DGs) without Kahe Unit 6 (which was still being repaired) and without the capability of CIP CT1 was 1,428 MW. Subtracting the amount required for the 180 MW spinning reserve left 1,248 MW of load service capability. It was anticipated that if the day peak was 1,246 MW, as was experienced the day before, there would be only 2 MW of excess spinning reserve ("XSR"). If the evening peak on October 8, 2009 matched the previous day peak of 1,260 MW, then there would be a spinning reserve deficit of 12 MW.

During the day of October 8, 2009, the system load that was served by the Hawaiian Electric generating units and the IPPs totaled 1,243 MW. The evening peak that was served was 1,260 MW, which matched the highest evening peak from the day before. During the evening peak on October 8, 2009, without CIP CT1, there was a spinning reserve deficit of 12 MW (out of 180 MW required to cover the loss of the largest unit, AES). Under these conditions, there was sufficient spinning reserve to cover the loss of any other unit except AES.

To mitigate the impact of the spinning reserve deficit during the evening peak on October 8, 2009, Hawaiian Electric dispatchers initiated the residential direct load control ("RDLC") at around 6:20 p.m. for a duration of about one hour to shut off selected water heater loads on the system. Approximately 6 to 8 MW of water heater load was shed, which offset the spinning reserve deficit. By taking these actions, Hawaiian Electric avoided running CIP CT1 even though the system conditions resulted in a Gen Con 1 condition (when not counting CIP CT1 capacity).

On the morning of October 9, 2009, the initial increase in system load was greater than what was experienced on October 8, 2009. During the day, the system peak reached 1,243 MW while Kahe Unit 6 was still off-line. All available generation, including the DGs, were on-line (CIP CT1 was held in reserve) to service the system loads while maintaining adequate spinning reserve. (See Exhibit 1.)

³ Hawaiian Electric's Kahe unit 6, a 142 MW generating unit, was shutdown the evening of October 7, 2009 for the purposes of repairing a steam leak in the reheat attenuator valve. The steam leak, if left un-repaired, could evolve into an employee safety risk because of the superheated steam that was escaping from the valve as well as a reliability risk should the steam leak suddenly worsen to the extent that Kahe 6 would have had to be tripped off-line due to the sudden loss of superheated steam.



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However, at 3:51 p.m., Waiau CT10 tripped off line removing 50 MW of generation capacity from the system.⁴ Upon the loss of Waiau CT10, the available capacity dropped to 1,198 MW, resulting in a spinning reserve deficit of 35 MW. The system load that was being served at that time was 1,218 MW and the available spinning reserve decreased to 145 MW, which was 35 MW less than the required spinning reserve of 180 MW.

The deficit between the rated capacity and the load as provided would have resulted in a reserve deficit of approximately 20 MW (1,198 MW generation capacity – 1,218 MW system load). However, at this time, because of the weather conditions, the Kalaeloa generating units were not able to provide their maximum output and additional minor deficits at AES and the remaining Hawaiian Electric units made up the difference in the shortfall. The deficit increased to 35 MW because Kalaeloa's output was limited to 198 MW, or 10 MW less than its maximum of 208 MW, and AES's output was limited to 178 MW, or 2 MW less than its maximum. Other smaller limitations existed among the remaining generators and by using these real operational capacities the spinning reserve decreased by 35 MW.

At 4:36 p.m., the RDLC was used once again to mitigate the spinning reserve deficit by reducing the impact of the increasing load on the spinning reserve. The Company turned the water heaters back on at 4:56 p.m.

Decision to Start CIP CT1

Based on the assessment of the system risk from having Kahe 6 and Waiau CT10 off-line and the uncertainty of when Waiau CT10 would be back on-line, the threat of the heavy rains with the possibility of lightning occurring and because the system load was expected to continue to be high over the evening peak, the decision was made to start CIP CT1 for this Gen Con 1 condition. Without Kahe 6 and Waiau CT10 generating units, it was determined that as the load increased toward the evening peak, the spinning reserve deficit would continue to increase and that the generating condition could fall further from Gen Con 1 to Gen Con 2 (-90MW < XSR < -40MW). In addition, with the island already experiencing heavy rains in the southeastern portion of Honolulu, the threat of lightning and the possibility of further disruptions to the system indicated that the system risks would be increasing rather than decreasing. Both of these factors were considered to be potential significant risks to the system.

CIP CT1 was started at 5:17 p.m. and quickly ramped up to serve the system load and to provide additional spinning reserve capacity. The unit was loaded to its minimum output of 40 MW and remained at this level while it was in operation. By starting CIP CT1 and placing 120 MW of firm capacity on the system, the spinning reserve deficit was eliminated, because the generating

⁴ After the Waiau 10 unit was online for several hours, there was an alarm indicating that there may have been a fire in the Waiau CT10 cab. Waiau CT10 was tripped off-line so that the problem could be investigated and corrective actions taken.

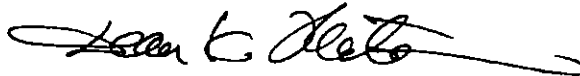


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unit had more than enough capacity to improve the generating condition from Gen Con 1 to BETA. Additionally, with CIP CT1 on-line and because of its performance characteristics (i.e., its ability to pick up load quickly) if a lightning strike caused a system disruption, having CIP CT1 on-line would provide additional generation support to mitigate the impact of the disruption. If CIP CT1 remained off-line and if a system disturbance occurred, depending on the severity of the disturbance, the Company may not have been able to start the unit quickly enough so that it could contribute during the emergency.

CIP CT1 remained on-line until Waiau CT10 was brought on-line and made available for operation at 6:02 p.m. With the lower loads and the cancellation of the flood advisory, CIP CT1 was taken off-line at 6:06 p.m., having run for a little over 45 minutes.

Very truly yours,



Dean K. Matsuura
Manager
Regulatory Affairs

Attachment

c: Catherine P. Awakuni (with Attachment)
Stacey K. Djou, Esq. (with Attachment)



Exhibit 1

DAILY GENERATION REPORT – Morning Edition

Friday October 9, 2009

1. TODAY'S SYSTEM CAPABILITY:

	Normal Capability	Derate	Available Capability	Running for Day Peak	Running for Eve Peak
K1	80	-80	0		
K2	60	-11	75	75	75
K3	60	-1	59	59	59
K4	60	-3	58	58	58
K5	142	-7	135	135	135
K6	142	-142	0		
W7	87		87	87	87
W8	90		90	90	90
W3	49		49	49	49
W4	47	-2	47	47	47
W5	57		57	57	57
W6	56		56	56	56
H8	56		56	56	56
H9	57		57	57	57
W9	53		53	53	53
W10	50		50	50	50
(changed 08/03/09) (note 1) CIP1	120		120		
(changed 06/03/07) DG	30		30	30	
HECO Total	1289	-262	1017	1017	987
HR	23	-23	23	23	23
(changed 9/28/05) KL1	104		104	104	104
(changed 9/28/05) KL2	104		104	104	104
AEB	160		160	160	160
IPP Total	434	-23	411	411	411
Total	1823	-275	1548	1428	1398
Spinning Reserve for largest unit	180		-180	-180	-180
Capability	1643		1368	1248	1218
Peak Forecast					
			1248	1248	1180
Excess Spinning Reserve (XSR)			38	38	38
Reserve Shutdown			120	120	150
Generation Condition			ALPHA	ALPHA	ALPHA
Total MW at risk			337	337	337
Largest individual risk condition (in MW)			90	90	90
Generation Condition upon loss of largest risk condition			BETA	BETA	BETA

Note that overpressure ratings are not included in the above capabilities

DG includes 10 MW at Ewa Nui (EN), 5 MW at Halemano (HM), 5 MW at Iwila Tank Farm (I), 5 MW at CEIP (CEIP) and 5 MW at Katsalos Pole Yard (PY)

Note 1: When not run for testing, or otherwise unavailable, CIP1 should be considered available for system requirements but dispatched as last in the dispatch order. Executive approval should be obtained to run the unit, unless circumstances preclude being able to do so in time to avoid load shedding or a system blackout.